

**Laboratory Environment Safety and Health Committee  
Cryogenic Safety Subcommittee**

MINUTES OF MEETING 04-12  
November 5, 2004

**Committee Members Present**

R. Alforque  
J.W. Glenn  
P. Kroon  
R. Karol\* (Acting Secretary)  
E. Lessard (Chairperson)  
P. Mortazavi  
K.C. Wu  
R. Gill  
N. Bernholc  
**(\*non-voting)**

**Committee Members Absent**

R. Travis\*  
S. Kane  
M. Rehak  
A. Sidi Yekhlef

**Visitors**

A. Zelenski  
J. Ritter  
V. LoDestro

**Agenda:**

Walkthrough of the Linac Oxford Magnet in B930

**Minutes of Meeting:** Appended on pages 1 through 2.

**Signature on File**

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E. Lessard              Date  
**LESHC Chairperson**

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J. Tarpinian              Date  
**ESH&Q ALD**

Chairperson E. Lessard called meeting 04-12 to order at 1330 on November 5, 2004.

The replacement OPPIS Oxford magnet was moved from Building 902 to Building 930 near the current OPPIS magnet to conduct cool down and energization. The Committee conducted a walkthrough of the area today.

The status of resolving the open items, from LESH C Meeting 04-12, was reviewed by E. Lessard with the Committee:

1. Review the Static Magnetic Field Subject Area and implement any required controls. Since the Oxford Magnet has a well-contained field, the existing OPPIS postings are expected to be conservative. – **Complete.**
2. Contact the Lifting Safety Committee (LSC) for a review of the Oxford Magnet Lift. The OPPIS Lift is considered a pre-engineered lift, because it is close to the crane's capacity. The Oxford Magnet is much smaller. **J. Ritter noted that he had discussed this with A. Pendzick, a member of the BNL LSC, and this is not a critical lift. Work planning will assure that the lifts are safe and satisfy BNL requirements.** **Complete.**
3. Perform an ODH calculation per the SBMS Subject Area. The calculation should include all cryogenic inventories that are subject to release from a single failure. There was some question at the meeting if the calculation should include both the Oxford and OPPIS cryogenic inventories. This could not be determined at the meeting without a detailed understanding of the testing procedure and configuration. Note also that LN2 is used for precooling. **L. Jia calculated that the 42 liters of LHe in the 506 m<sup>3</sup> room would result in >19.5% oxygen. This conservatively ignored any exhaust ventilation. Since this is >18% oxygen concentration, no ODH controls are necessary. R. Karol checked L. Jia's calculation. It was determined that failure of both magnets simultaneously was not a credible scenario. Although not needed, it is noted that an ODH monitor is installed in the area which alarms at 18%, the same as the RHIC monitors. This monitor is calibrated and maintained by the C-AD Access Controls Group.** **Complete.**
4. Provide the Cryogenic Subcommittee with a magnet-specific fill procedure, including a flow diagram. **This is currently under review by LESH Committee member A. Sidi Yekhlef.**
5. Label the lines on the magnet (e.g., fill, vent, unused lines). **Still needs to be done.**
6. Contact a member of the Laboratory Electrical Safety Committee for a review as this magnet is not listed by a recognized U.S. Testing Laboratory. **The power supply manual indicates that it was tested to the manufacturer's specifications. V. LoDestro is trying to obtain the required testing documentation from the manufacturer of the power supplies. As long as BNL maintains this successful test documentation, the OSHA requirements will be satisfied.**

7. Contact the C-AD Accelerator System Safety Review Committee, Woody Glenn, to arrange for an ASSRC review of the Oxford Magnet. **W. Glenn asked for information for an ASSRC meeting which will be scheduled before routine operations are approved. Complete.**

Comments and questions from the Committee during the walkthrough resulted in the following actions that need to be completed for the specific evolutions listed below:

**For cooldown of the Oxford Magnet:**

1. Install a shield around the two quench vents to protect personnel from venting helium gas. The current vent configuration is not to be modified in order to not change the vent path resistance.
2. As described above in item 4 in the minutes, use an approved magnet-specific fill procedure, including a flow diagram.

**For Energizing the Oxford Magnet:**

1. Install a top cover on the upper Oxford Magnet power supply drawer.
2. Update all the Magnetic Field Warning Signs to the current SBMS format and ensure that they are posted such that the 5-Gauss field is within the posted area.
3. Plug the hole in the floor by the magnet.
4. Ensure that loose ferrous objects are at a safe distance from the magnet before energizing.
5. Ensure that magnet cabling is safely routed off the floor to prevent trip hazards.
6. It is permissible to use the Oxford power supplies for brief period of time to energize the magnet. However, the supplies may not be left energized and unattended until the OSHA requirements for testing documentation are satisfied as described above in item 6 of the minutes.

**To Move and Interchange the Existing and the New OPPIS Magnets:**

1. Use detailed Work Planning to ensure that lifting and magnet movements are done safely and in accord with BNL requirements. These moves will be made while the magnets still have LHe inventory. The LHe inventories should be minimized, consistent with operational requirements.

**Prior to Routine Operations:**

1. Have the C-AD ASSRC conduct an appropriate review.
2. Label the lines on the magnet as described above in item 5 of the minutes.

W. Glenn recommended approval of these conditions for each phase of testing, installation and operations, seconded by P. Kroon. The Committee voted unanimously in favor of this recommendation.

The meeting adjourned at 1430.

## **Lessard, Edward T**

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**From:** Travis, Richard J  
**Sent:** Friday, October 29, 2004 3:01 PM  
**To:** Zelenski, Anatoli; Ritter, John; Durnan, James T; Alforque, Rodulfo; Glenn, Joseph W; Kane, Steven F; Kroon, Peter J; Lessard, Edward T; Mortazavi, Payman; Rehak, Margareta L; Sidi-Yekhlef, Ahmed; Wu, Kuo-Chen; Pendzick, Alexander F; Jia, Linxiang; Karol, Raymond C; Sandberg, Jon N  
**Cc:** Curtiss, Joseph A; Travis, Richard J  
**Subject:** LESHC 04-12, LINAC Oxford Magnet - PreMeeting Inspection Recommendations

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

**All,**

At the request of the Physics Department, a meeting was held in the highbay of Building 902 to inspect the Oxford Magnet. The attendees were: A. Zelenski, J. Ritter, J. Durnan, K.C. Wu, Ed Lessard, and Rich Travis.

The Oxford magnet was formerly used by A. Zelenski at TRIUMF. It was recently shipped to BNL and is expected to replace the OPPIS magnet in the LINAC, as it has lower LHe consumption and will improve the tuning of the polarized beam for RHIC. The original intent of this inspection was to determine what prerequisites were necessary prior to a cooldown in Bldg 902. However, due to schedule constraints, the Physics Department has decided to limit work in Bldg 902 to a receipt inspection and a leak test. The cooldown and energization will take in-place at the LINAC. The OPPIS magnet will be staged adjacent to the beamline and maintained cold during the testing as a backup.

A LESHC Cryogenic Subcommittee review will be required prior to cooldown or energization of the Oxford Magnet. (Physics is requested to notify the LESHC Secretary one week in advance, so that a mutually convenient day and time can be found for this meeting.)

In anticipation of this meeting, the following input was offered to Physics:

1. Review the Static Magnetic Field Subject Area and implement any required controls. (Since the Oxford Magnet has a well-contained field, the existing OPPIS postings are expected to be conservative.)
2. Contact the Lifting Safety Committee (e.g. [Steve Kane or Art Pendzick](#)) for a review of the Oxford Magnet Lift. (The OPPIS Lift is considered a pre-engineered lift, because it is close to the crane's capacity. The Oxford Magnet is much smaller.)
3. Perform an ODH calculation per the SBMS Subject Area. [Lin Jia and Ray Karol](#) could possibly help with this task. The calculation should include all cryogenic inventory that is subject to release from a single failure. (There was some question at the meeting if the calc should include both the Oxford and OPPIS cryogenic inventories. This could not be determined at the meeting without a detailed understanding of the testing procedure and configuration.) Note also that LN2 is used for precooling.
4. Provide the Cryogenic Subcommittee will a magnet-specific fill procedure, including a flow diagram.
5. Label the lines on the magnet (e.g., fill, vent, unused lines).
6. Contact a member of the Laboratory Electrical Safety Committee (e.g. [Jon Sandberg](#)) for a review as this magnet is not listed by a recognized U.S. Testing Laboratory.  
With the exception of the return line (# 4 above) the attendees agreed that any modifications to the magnet, including repiping the relief valves, would require Cryogenic Safety Subcommittee review.
7. Contact the C-AD Accelerator System Safety Review Committee ([Woody Glenn](#)) to arrange for an ASSRC review of the Oxford Magnet.

Thanks!  
Rich